

# ***Pythium* Corneal Ulcer in Ramathibodi Hospital**

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## **Abstract**

This is a retrospective study of corneal ulcers caused by *Pythium insidiosum* in Ramathibodi Hospital from 1988 to 1998. The clinical data was from the medical records of 10 patients, of which 8 had complete information. Mean age of the patients was 49.8 years old and seven were farmers. Initial visual acuity was mostly below finger counts. All manifested as fungal corneal ulcers, diagnosis of *Pythium insidiosum* was confirmed by histology. After failed medication, penetrating keratoplasty (PKP) was performed in order to remove the infected tissue. One patient had only anterior lamella keratectomy performed and was completely cured. Seven other patients had to have their eyes removed (evisceration or enucleation) to be cured.

The study shows that *Pythium* corneal ulcer is rare but devastating. Patients with an agricultural occupation are most at risk. Antibiotics and antifungals could not control or cure this disease, so education for people at high risk is advocated.

**Key word :** Corneal Ulcer, *Pythium*, Fungal Corneal Ulcer, Ramathibodi Hospital

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Corneal ulcer is one of the common causes leading to the loss of vision in Thai patients<sup>(1,2)</sup>. The causative organisms are bacteria, fungus, virus and protozoa. These organisms enter the cornea by a

defective barrier such as corneal abrasion or direct penetration in some cases. Among many precipitating factors such as abnormal eyelids, tear dysfunction, corneal abnormalities, systemic disease or drugs that

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decrease the body immune system, trauma is likely to be the most common cause. *Pseudomonas* and *Streptococcus* are the most common organisms. In the present study "*Pythium insidiosum*" is the only organism discussed.

*Pythium* infection (Pythiosis) is uncommon but it is one of the devastating infections that can blind the eye despite early detection and treatment. Pythiosis is actually a disease of plants and fishes. But mammals can also be infected from direct contact through injuries. Cats, dogs, cattle, horses and human were reported to have been infected and causing death<sup>(3)</sup>.

Corneal ulcers from *Pythium* have been reported from around the world<sup>(4-6)</sup>. In Thailand, these infection were found mostly in farmers with a history of contaminated water and vegetative materials accidentally injuring the eye.

## MATERIAL AND METHOD

This was a retrospective study of patients with *Pythium* corneal ulcer in the Department of Ophthalmology, Ramathibodi Hospital from 1988 to 2001 and all histology were confirmed by the Department of Pathology, Ramathibodi Hospital. Of 10 patients, eight were eligible and 2 were ruled out due to incomplete information. Six males and 2 females had an age range from 26 yrs - 62 yrs. (Mean age of 49.8 yrs). Almost all the patients lived in rural areas outside Bangkok. Seven of the patients were farmers.

Ages, occupation, onset of infection, method of diagnosis, initial visual acuity (VA) and final outcome were analyzed.

The data are presented in Table 1.

## RESULTS

The mean onset from time of first symptom to admission was 12.5 days (range 3-30 days). All patients had *Pythium* corneal ulcer only in one eye (unilateral); no specific preferences between left and right eye. Initial corneal scraping was performed in all patients for gram stain, KOH and culture. Two patients had only polymorphonuclear cells and 2 had gram-positive cocci. There were 4 patients with positive hyphae on 10 per cent KOH smear.

The initial visual acuity (VA) ranged from 20/70 to perception of light (PL). There was only one patient with an initial VA of 20/70, while others were finger count or worse. All the patients had at least one

of the clinical manifestations commonly found in fungal corneal ulcer such as hypopyon, endothelial plaque, feathery or satellite like lesion. All 8 patients were positive for *Pythium insidiosum* by culture, two from corneal scrape, five from full thickness corneal buttons, and the last one from partial corneal tissue.

Though they were treated with antifungal agents such as amphotericin B, miconazole, itraconazole, fluconazole and natamycin, also with some antibiotics, penetrating keratoplasty (PKP) was inevitably performed in seven cases due to corneal impending perforation and perforation. Anterior lamella keratectomy was done in only one case with an initial VA of 20/70 and retained the same final VA. All 7 PKP cases became worse and eventually lost their eyes, 4 by enucleation and 3 by evisceration.

## DISCUSSION

*Pythium* corneal ulcer is a rare infection but one of the most devastating. *Pythium insidiosum* is the only one of its species known to infect humans. Bridges and Emmars first named it *Hyphomyces destruens*<sup>(7)</sup>. Then later in 1987, the correct binomial of *Pythium insidiosum* was proposed by De Cock<sup>(8)</sup>.

*Pythium* is known as aquatic fungi. They cause primary diseases in plants and fishes. However, they are not a true fungi, they belong to the Kingdom *Stramenopila*. *Pythium* develops septate fungus-like hyphae in cultures. They need a damp environment to complete their life cycles<sup>(9)</sup>. The infections come from direct contact in damp areas such as swamps and rivers.

*Pythium* corneal ulcer manifests clinically the same as other fungi do. Suspicion should be cautious in every case with characteristics of fungal corneal ulcer especially those which failed antifungal therapy.

From reports of human skin pythiosis, the goal of treatment is to remove as much of the infected tissue as possible. This will save the life of the infected patient and prevent further systemic infections. Since antifungal and antibiotic agents were ineffective in the present study, removal of the infected tissue surgically, either lamella keratoplasty or PKP might be beneficial.

Overall early intervention of *Pythium* corneal ulcer should be assessed. Badenoch et al used DNA sequencing to detect early infection of *Pythium insidiosum*<sup>(10)</sup>. For the treatment modality, there was

Table 1. Clinical data of 8 patients with *Pythium* corneal ulcer in Ramathibodi Hospital from 1988 to 2001.

Patient	Age	Sex	Province	Occupation	Onset (days)	Eye	Gram	KOH	Initial	Tissue for + ve culture	Final surgery	Final VA
1	60	M	Nakorn Prathom	Farmer	10	L	PMN	+ ve	PJ	Corneal button	evis	NPL
2	51	M	Nakorn Sawan	Farmer	30	R	G⊕ cocci	+ ve	HM	Corneal button	evis	NPL
3	62	M	Ayutthaya	Farmer	3	R	- ve	+ ve	NA	Corneal scraping	enuc	NPL
4	59	M	Pathum Thani	Farmer	4	L	- ve	- ve	HM	Corneal button	enuc	NPL
5	36	F	Prachuap Khiri Khan	Farmer	14	R	PMN	- ve	CF	Corneal button	enuc	NPL
6	57	M	Nonthaburi	Farmer	5	L	G⊕ cocci	+ ve	CF	Corneal button	evis	NPL
7	26	M	Bangkok	Driver	14	R	- ve	- ve	20/70	Anterior corneal tissue	ALK	20/70
8	48	F	Chonburi	Farmer	20	L	- ve	- ve	PL	Corneal scraping	enuc	NPL

**Abbreviations**

M - male, F - female

L - left, R - right

PMN - polymorphonuclear cells, G + Cocci - gram's stained positive cocci

- ve - negative , + ve - positive

enuc -enucleation, evisc - evisceration

PJ-light projection, HM-hand motion, CF-finger counts, NPL-no perception to light

ALK-anterior lamellar keratectomy

one report using vaccination to cure systemic Pythiosis. The serum or synthesized passive immunity of the vaccine may be useful in the future<sup>(11)</sup>. Above all,

prevention of infection by educating people at high risk (farmers and workers in damp environments) is advocated.

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## ภาวะกระจกตาติดเชื้อจาก *พืเชียม* ในโรงพยาบาลรามธิบดี

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ได้ศึกษาย้อนหลังการติดเชื้อ *Pythium insidiosum* ที่กระจกตาในโรงพยาบาลรามธิบดี ตั้งแต่ปี 2531 ถึงปี 2541 โดยการศึกษาถึงข้อมูลการติดเชื้อ จากอายุ อาชีพ ระดับสายตาแรกพบ การวินิจฉัย และวิเคราะห์ถึงผลของการรักษาจากเวชระเบียนของผู้ป่วย 10 คน มีข้อมูลที่สามารถวิเคราะห์ได้เพียง 8 คน มีอายุเฉลี่ย 49.8 ปี โดย 7 คน มีอาชีพเกี่ยวกับการเกษตร ระดับสายตาแรกพบส่วนใหญ่เป็นแค้นับนิ้วได้ถึงต่ำกว่า ลักษณะรอยโรคที่กระจกตาจะคล้ายกับการติดเชื้อราอื่นที่กระจกตา ยืนยันการวินิจฉัยจากการพบเชื้อ การรักษาด้วยยาไม่ได้ผล ถึงแม้จะทำการเปลี่ยนกระจกตาเพื่อลดปริมาณเชื้อลง มีผู้ป่วย 1 รายที่ทำ anterior lamella keratectomy แล้วหายจากการติดเชื้อ ส่วนผู้ป่วยที่เหลือต้องผ่าตัดลูกตาออก (enucleation หรือ evisceration) สุดท้ายจึงสามารถกำจัดเชื้อ *พืเชียม* ได้หมด

การศึกษานี้ทำให้เห็นว่าเชื้อ *พืเชียม* แม้จะพบได้ไม่บ่อย แต่มีโอกาสทำให้เกิดการสูญเสียดวงตาได้มาก ผู้ป่วยวัยกลางคนอาชีพเกษตรกรเป็นปัจจัยเสี่ยงที่สำคัญ การใช้ยาปฏิชีวนะกับยาต้านเชื้อราไม่สามารถกำจัดเชื้อนี้ได้ น่าจะมีการค้นหาวิธีการรักษาอื่น อย่างไรก็ตามการให้ความรู้กับผู้ป่วยที่เสี่ยงต่อการติดเชื้อเพื่อป้องกันเป็นสิ่งที่ควรจะทำ

**คำสำคัญ :** แผลเบือยกระจกตา, *พืเชียม*, แผลเบือยกระจกตาจากเชื้อรา, โรงพยาบาลรามธิบดี

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